BILLIETURNERA (MALVACEAE), A NEW GENUS FROM TEXAS AND MEXICO

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ABSTRACT

The species *Sida helleri* is segregated out of *Sida* and placed in the new genus *Billieturnera*, named in honor of the noted Texas botanist, B. L. Turner. The new genus is of isolated taxonomic position but has a greater affinity with *Abutilon* than with *Sida*. It occurs in southern Texas and northeastern Mexico (Nuevo León and Tamaulipas).

Billieturnera Fryxell, nom. et stat. nov.

Based on: *Sida* sect. *Incanifolia* Clement, Contr. Gray Herb. Harvard University 180: 60. 1957. TYPE SPECIES: *Sida grayana* Clement ex Kearney

Perennial ascending subshrub, frequently more or less procumbent, commonly on poorly drained (caliche, gypsiferous, or heavy clay) soils, seldom more than a few cm tall. Plant softly stellate-pubescent more or less throughout, the hairs 0.5–1 mm long, sometimes stipitate. *Leaves* cuneate, sparingly dentate to subentire, 0.5–1.5 cm long, about as broad. *Petioles* about half length of lamina. *Stipules* prominent, broadly oblanceolate and obtuse (to 3.5 mm broad), persistent, subequal to petiole. Flowers solitary in the leaf axils, subsessile, the *pedicels* up to 2.5 (–5) mm long, medially articulated. *Involucel* absent. *Calyx* 5–7 mm long, more than 2/3-divided, the lobes narrowly triangular, 2–6 times as long as wide. *Petals* pale yellow, somewhat exceeding calyx, 5–8 mm long, ca 3 mm broad, obovate, glabrous. *Staminal column* pallid, with few minute scabrid hairs, dividing apically into ca 20 filaments (imperfectly associated in 5 fascicles), the filaments 1–1.5 mm long, the anthers pallid. *Styles* 5, pallid, glabrous, exceeding androcecium and subequal to petals; *stigmas* pallid, capitate or capitellate. *Fruit* ca 5 mm long, 4.5 mm diameter, variable in form, enclosed in calyx; *mericarps* 5, each with prominent apical spine 1–1.5 mm long becoming double after dehiscence, somewhat inflated, more or less elliptical in cross-section, with dorsal keel; *seed* solitary in lower part of carpel, pendulous, ca 2 mm long, dark brown, minutely and obscurely pubescent.

Clement (1957) recognized the distinctiveness of this taxon as *Sida* sect. *Incanifolia* Clement. He acknowledged the resemblance of the fruits to those of *Abutilon* but nevertheless retained his section within *Sida*, following earlier understandings and practice, simply because it has uniovulate carpels and lacked an involucel. It is now understood that the number

SIDA 9(3): 195–200. 1982.

of ovules and seeds per carpel can sometimes be misleading and that other factors need to be considered in evaluating generic placements and generic affinities in the Malvaceae. In the present case, the morphology of the fruits clearly points to a general affinity with *Abutilon* and virtually no affinity with *Sida*, except in having the uniovulate condition. Traits supporting an affinity with the *Abutilon* alliance (as proposed by Bates & Blanchard, 1970, and modified by Fryxell, 1971) include a base chromosome number of $x = 8$ (Bates, 1976), which is characteristic of *Allowissadula* Bates and part of *Abutilon*, and pollen grains having only three apertures (Hashmi, 1970). The same base chromosome number occurs in some members of the *Sida* alliance, but pollen grain apertures are generally more numerous, except in the genus *Malvella* (which may in fact not be properly placed in the *Sida* alliance). The matter of mericarp morphology, however, clearly indicates that *Billieturnera* has its affinities with the genera of the *Abutilon* alliance (here taken to include *Abutilon* sens. lat., *Allowissadula, Wissadula* Med., *Bastardiastrum* (Rose) Bates, *Bastardia* H.B.K., *Hochreutinera* Krapov., and *Briquetia* Hochr.). In the *Abutilon* alliance, mericarps are basically elliptical in cross-section with a more-or-less well-developed dorsal keel. In the *Sida alliance*, on the other hand, mericarps are trigonal in cross-section with a dorsal wall clearly differentiated from the two lateral walls (Fryxell, 1971).

Therefore, in considering whether *Billieturnera* merits segregation as a distinct genus, we need to consider its relationship to the genera of the *Abutilon* alliance, but we may ignore its relationship to the genera of the *Sida* alliance. I believe one should not segregate monotypic genera too freely, but only if a strong case for their naturalness can be made (Grashoff, 1975, following the criteria of McVaugh, 1945). I am unable to find a single species among the several genera of the *Abutilon* alliance with which the present species might be allied. Its leaf form is unique. Its stipules are unique. Its humble growth habit is approached only by species like *Abutilon parvulum* A. Gray, *Abutilon terminale* (Cav.) St.-Hil., or *Wissadula glechomatifolia* (St.-Hil.) R. E. Fries, which are manifestly unrelated. Its uniovulate carpels are matched only by species of *Bastardia* (having an entirely different growth habit and a base chromosome number of $x = 7$) and *Abutilon* sect. *Tetrasida* (Ulbrich) Krapov., a taxon that perhaps merits recognition as the genus *Abutilothamnus* Ulbrich; Krapovickas (1969) recognized eight species in the section to which one or two more species might be added. These species, however, are principally large-leaved trees of predominantly South American distribution and are very unlike *Billieturnera* in all characters except in having uniovulate, pentamerous fruits. The strictly pentamerous fruits of *Billieturnera* also occur in *Allowissadula*, some species of *Abutilon* (of sects. *Tetrasida, Oligocarpae*, and *Anasidae*), and *Bastardia bivalvis*, but again the present species can be accommodated in none of these groups without stretching their bounds beyond reasonable limits and rendering them artificial taxa.

The distribution of *Billieturnera* is more or less distinctive, occurring in South Texas, Tamaulipas, and part of Nuevo León. In this region it does overlap species of *Abutilon, Allowissadula*, and *Bastardia*, but if one considers both the geographic and the ecological distribution of *Billieturnera*, its distribution is clearly distinctive. Its preference for heavy, saline soils gives it virtually a unique niche among the Malvaceae. The only other Malvaceae of this general region to occur on such soil types are *Cienfuegosia drummondii* (A. Gray) Lewton (of a different tribe within the family and thus quite unrelated) and the three species of *Malvella* (Fryxell, 1974). Doubt has already been expressed about the placement of *Malvella* within the *Sida* alliance, but no better placement immediately presents itself. Therefore, a relationship between *Billieturnera* and *Malvella* must be considered. They share not only a preference for saline habitats and a humble growth habit, but also 3-aperturate pollen grains and a compatible base chromosome number (x = probably 16 in *Malvella*; x = 8 in *Billieturnera*). One species of *Malvella, M. leprosa* (Ortega) Krapov., also has a somewhat similar leaf shape. But the differences are also marked. *Malvella* differs from *Billieturnera* in being herbaceous and prostrate, in having asymmetrical distichous leaves, inconspicuous subulate stipules, sometimes lepidote pubescence, long-pedicellate flowers and fruits, a sometimes present involucel, broadly ovate or cordate calyx lobes, and unornamented essentially indehiscent mericarps. I believe these differences are sufficient to prevent combining the two genera. The presence of an involucel and the different mericarp morphology especially deserve emphasis. I believe the similarities betwen *Malvella* and *Billieturnera* are incidental rather than indicative of close alliance. Clement (1957) also emphasized the difference between these two taxa, which he recognized as *Sida* sect. *Pseudomalachra* (= *Malvella*) and *Sida* sect. *Incanifolia* (= *Billieturnera*).

Thus, *Billieturnera* appears to be a distinctive genus meriting segregation, having an alliance with *Abutilon* and its allies, but being relatively isolated within this group. It is a plant of humble mien but having a salty nature (at least in its soil preference), frequently procumbent, inhabiting Texas and Mexico, of isolated taxonomic position (i.e. without peer), and it thus appropriately memorializes the noted Texas botanist, Billie Lee Turner. Now you can't say that no one ever named a genus after you, Billie!

BILLIETURNERA **helleri** (Rose) Fryxell, comb. nov.

Basionym: *Sida helleri* Rose ex Heller, Contr. Herb. Franklin & Marshall College (Bot. Explor. S Texas) 1: 66. 1895. TYPE: TEXAS. Nueces Co: shores of Corpus Christi Bay, *Heller 1533* (ARIZ!, F!, GH!, LE!, MICH!, NY!, PH!, UC!, US!).

Synonym: *Sida cuneifolia* A. Gray, Boston J. Nat. Hist. 6: 165. 1850 (non Roxb. 1832). TYPE: TEXAS. [Maverick County:] 35 mi NE of Eagle Pass, 1848, *Wright s.n.* (HOLOTYPE: GH!; fragment: US!). *Disella cuneifolia* (A. Gray) Greene, Leafl. Bot Observ. Crit. 1: 209. 1906. *Sida grayana* Clement in Kearney, Leafl. W. Bot. 7: 140. 1954.

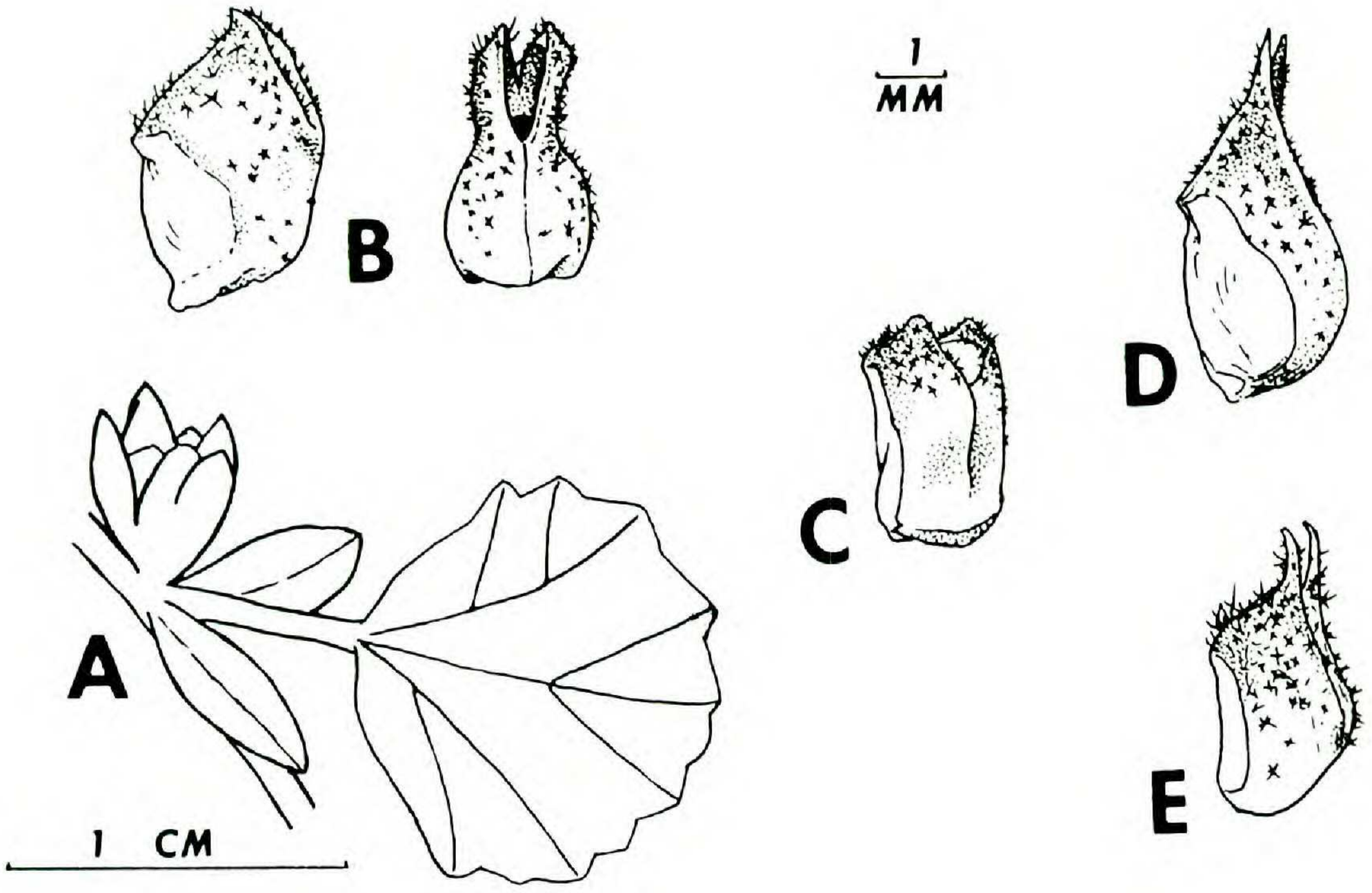

Figure 1. *Billieturnera helleri.* A, leaf and stipules with young axillary bud (pubescence omitted); B, individual mericarp in lateral and dorsal view [A-B, *Heller 1533*, the type]; C-E, individual mericarps (C, *Jones 28239*; D, *Correll 35440*; E, *Bartlett 10969*), showing morphological variability.

Clement (1957) recognized two species in this group but the distinctions he noted are not borne out by an examination of a wide range of material. The morphology of the mericarps is quite variable (see Fig. 1), but the variation appears to be continuous rather than discrete and is correlated with no other characters. Therefore, the plants are here interpreted as a single species, variable in fruit morphology.

Specimens examined: MEXICO: TAMAULIPAS: 6 mi S of Santander Jiménez, *M. C. Johnston & Graham 4390* (MEXU, MICH, TEX); 4 mi S of Jiménez on the Soto la Marina road, *M. C. Johnston & Crutchfield 4990* (MEXU, MICH, TEX); 21 mi N of Victoria on the Villagran hwy, 3 mi S of Río Purificación crossing, *M. C. Johnston & Crutchfield 5440* (MEXU, MICH, TEX); 4 mi S of Rancho Guadalupe, ca 25 mi from [S of ?] Linares, N. L., *M. C. Johnston & Graham 4261* (MEXU, MICH, TEX); Sierra de San Carlos, vicinity of El Mulato near Tanque, *Bartlett 10969* (DS, MICH); 8 mi S of Tres Palos (119 km N of Cd. Victoria), *Fryxell 1087* (ARIZ, BH, CTES, MEXU, UC, pf); on Peninsula Punta Piedra, S of Carboneras, *Fryxell 3647* (CHAPA, ENCB, MICH, MEXU, TEX, pf); El Canelo Ranch, 24 mi N of San Fernando (hwy to Matamoros), *M. C. Johnston 4864* (MEXU, MICH, TEX). NUEVO LEON: 20 mi E of General Bravo, badlands of the Jackson formation, *M. C. Johnston 4359* (MEXU, MICH, TEX); 23 mi E of General Bravo on Reynosa hwy, *M. C. Johnston & Crutchfield 6060* (LL, MICH,

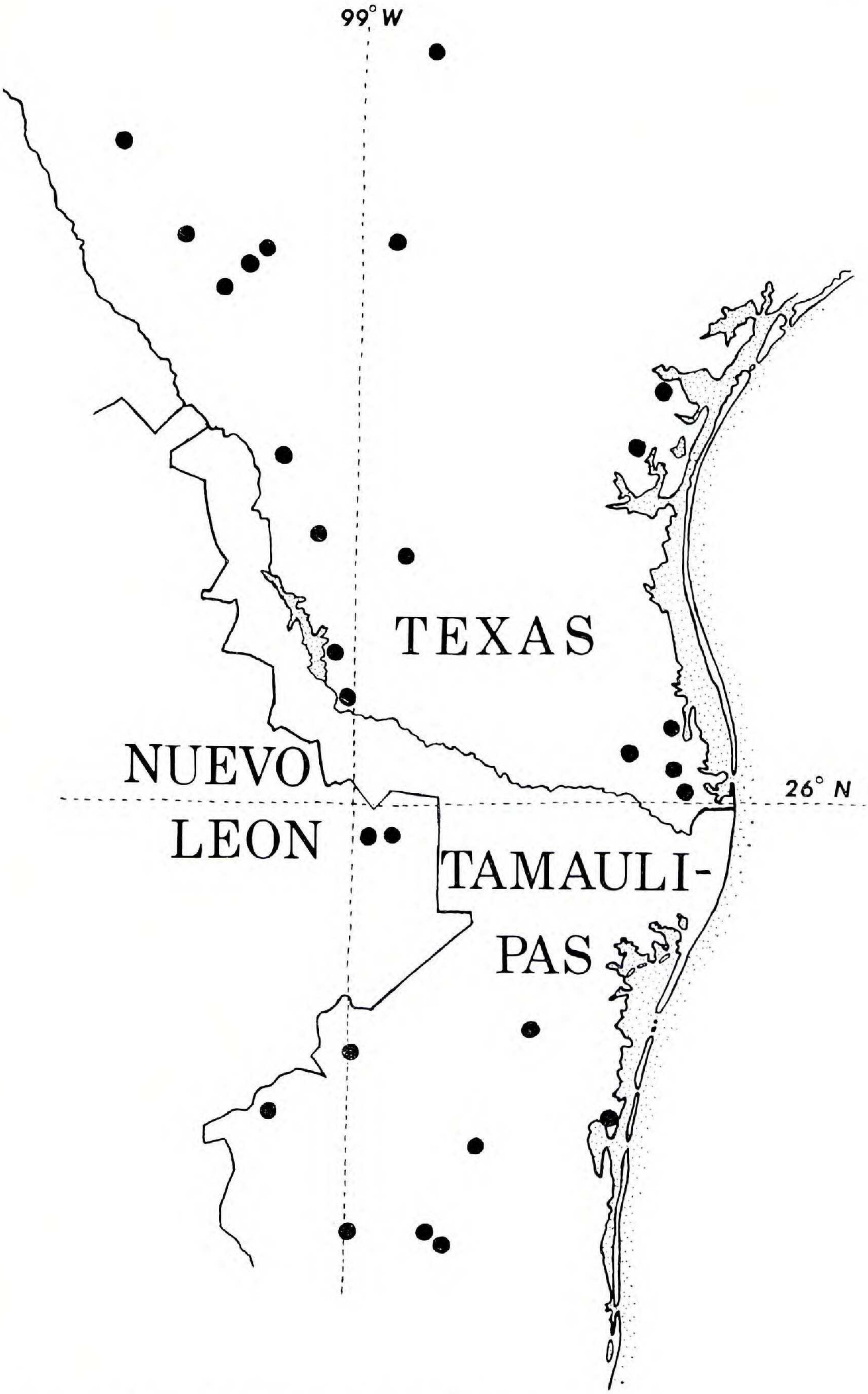

Figure 2. Geographical distribution of *Billieturnera helleri*.

TEX, UC). UNITED STATES: TEXAS. Cameron County: Loma Alta, 8 airline mi NE of Brownsville, *Cory 51383* (DS, SMU, UC), *Runyon 2942* (TEX) *5082* (TEX) *6032* (TEX); top of Loma de la Cuchilla, a clay dune W of Port Isabel, *M. C. Johnston 542195* (SMU, TEX); Arroyo Colorado, 2 mi E of Harlingen, *M. C. Johnston 541360* (TEX) *541361* (TEX); Laguna Atascosa Wildlife Refuge, *Fleetwood 3493* (TEX) *3529* (TEX); El Jardin Tract, *Runyon 455* (TEX) *654* (TEX). Starr County: 1/2 mi W of Roma, *Wood 749* (SMU, TEX); Falcon State Park, *Fleetwood 11588* (SMU, pf); ca 4 mi W of Fort Ringold, *Tharp & York 13* (ENCB, TEX). Zapata Co: 23 mi NE of San Ignacio, *Correll 35440* (LL., UC). Jim Hogg Co: 25 mi S of Hebronville, *Hanson 30* (MO, US). Kleberg Co: King Ranch, Laureles Division, ca 1 mi W of Portales Verde Well, *Miller & Miller 1058* (SMU). Nueces Co: shores of Corpus Christi Bay, *Heller 1533* (ARIZ, F, GH, LE, NY, UC, US). Webb Co: 7 mi E of Laredo, 26 Apr 1919, *Manson s.n.* (NY). LaSalle Co: 12-1/3 mi W of Fowlerton, *Cory 14979* (TEX); 2 mi S of Los Angeles, *Cory 14980* (GH). Dimmitt Co: Carriso Spring, *Jones 28239* (CAS, DS, UC); ca 3 mi S of Catarina, *Fryxell 2938* (CHAPA, CTES, ENCB, NY, pf), *Correll & Johnston 19503* (LL, SMU); 10 mi S of Big Wells, *Tharp 593* (TEX, US). Atascosa Co: 3 mi S of Hindes, *M. C. Johnston 6198* (ENCB, LL, TEX). Maverick Co: 35 mi NE of Eagle Pass, 1848, *Wright s.n.* (GH, US). Bexar Co: near San Antonio, *Parks 4819* (MO).

Without precise locality (Nuevo León, fide Clement): *Berlandier 3104* (PH, US).

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